top than at bottom. Cut back the shale bank a hundred feet along the length of the terrace, and another series of pits will begin to form, while nothing will remain to mark the former position or existence of the present line of holes.

The Ice-hobby has been pretty well ridden of late; it shifts the earth's centre of gravity, causes the ocean to rise and fall, sinks down continents into the molten magma on which they float, creeps out from the north over hundreds of miles of flat; marches over mountains like nothing, like the old soldier's nose in the fairy tale; grinds to powder the hardest rock, scoops out basins indifferently in soft Miocene gravels or crystalline schists, and yet has so little shearing force that the upper and under parts move often in diametrically opposite directions; it eddies round like a whirlpool in water, turns back upon itself with a kind of perpetual motion, hollows out combes on mountain flanks (and every hill-side that is not convex is a combe), and now yields to the soft allurement of a bed of shale. One is tempted to ask what feat it will perform next; perhaps it will be found to be the cause of wide-spread metamorphism. But we shall see.

V.—On the Terms "Bernician" and "Tuedian."

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At the London Meeting of the North of England Institute of Mining Engineers last June, I read a paper in which I ventured to put forward a scheme of classification of the Carboniferous rocks of Northumberland which I believed to be both a natural and a convenient one. The leading features of this scheme will be best understood by glancing at the following table with which my paper concluded.

Table—Correlating proposed Divisions with Old Ones.

Northumberland, proposed.			Synonyms.	
Carboniferous.	Upper.	COAL MEASURES.	Coal Measures.	Upper Carboniferous.
		Gannister Beds.	Gannister Beds.	
		Millstone Grit.	Millstone Grit and Carboniferous Limestone in part.	Middle Carboniferous.
	Lower.	BERNICIAN.	Yoredale Series and Calcareous Group in part.	
			Scar Limestone Series and Calcareous Group in part, *plus* Carbonaceous Group.	Lower Carboniferous.
		TUEDIAN.	Calciferous Sandstone, or Tuedian, or Valentian, and Upper Old Red Conglomerate in part.	

The chief points insisted on by me were,—1. The division of the Carboniferous rocks into Upper and Lower only,—2. The recognition of the Gannister Beds and Millstone Grit only as subordinate members of the Coal-measures Group,—3. The adoption of the names Bernician and Tuedian for the two great series constituting the Lower Carboniferous, and including all the rocks from the Yoredales to the Upper Old Red Conglomerate, both inclusive. The reasons for these changes need not be repeated here.

When, in the discussion which followed the reading of this paper, Mr. Warrington Smyth condemned the coining of new names for divisions of local value, I had little to say in answer to the charge, since I was conscious of having a year before been guilty of proposing the word "Bernician" at the Bristol Meeting of the British Association and in the GEOLOGICAL MAGAZINE. The words Coal-measures, Gannister Beds, and Millstone Grit were as old as the hills, and the only expressions that could be called in question were "Bernician" and "Tuedian." Of these the latter was proposed in 1855 by Mr. George Tate, of Alnwick, who up to about ten years ago was perhaps the only man who had studied the Calciferous Sandstone series south of Scotland. I therefore could only feel responsible for the term "Bernician," and with an author's modesty I refrained from then giving that name all the praise which I felt it deserved. I am now no longer in that embarrassing position, and can now say (what I then thought) that the word is an excellent, most appropriate, and convenient one, and that it is well fitted to come into general use.

The fact is that it turns out that I am not the originator of "Bernician." Within the last few weeks I have discovered this, and hasten to throw the responsibility of its creation on the shoulders of one whose reputation is far better able to bear it. The term was proposed in 1856 by the late Dr. S. P. Woodward, who, at p. 409 of his "Manual of the Mullusca," thus defines the Carboniferous portion of the geological column:

IV. [Carboniferous]	8. Bernician.	Carboniferous Limestone (Shale and Coal).
	9. Demetian.	Coal-measures (Millstone, Grit, Coal, etc.).

Nothing more is said as to these terms, and except in the "Manual" they have not been reprinted anywhere to my knowledge until 1874, when Karl Mayer printed his table of sedimentary rocks, in which he characterizes the Carboniferous system as follows:

III. KOHLEN-GEBILDE.

B. Demetian (Woodward, 1859)	I. *b.* S. Etienner Schichten (Mayer, 1874).
	I. *a.* Stadtberger ,, ,,
A. Bernician (Woodward, 1859)	II. Elberfelder ,, ,,
	I. Viséer ,, ,,

The date 1859 is a mistake. It was on seeing this table a few days ago that my attention was drawn to Dr. Woodward's use of the term Bernician. As no explanation of this term is given in the Manual, in which, indeed, it appears but once, it is perhaps not surprising that it should have escaped general attention. That Dr. Woodward should have proposed it, that Dr. Karl Mayer should, after the lapse of many years, have adopted it, and I may add, that it should have occurred independently to a writer in 1875; all this is good *primâ facie* evidence that the name has something to recommend it. Before discussing its merits, however, it may be well to consider what other names it was to take the place of. These we may divide into two sets—A, those which have a lithological signification, and which only constant usage can make us tolerate, and B, geographical names.

A.—*Lithological names*:

1. Mountain Limestone.
2. Carboniferous Limestone.
3. Sub-Carboniferous.
4. Productus Limestone.
5. Fusulina Limestone.
6. Anthraciferous Series (in part).
7. Carboniferian (in part).
8. Blue Limestone (Calcaire bleu).

B.—*Geographical name*:

1. Condrusian (in part).

Of the lithological names No. 1 is respectable by reason of its age, but it is singularly inapplicable to the numerous districts where the calcareous parts of the Lower Carboniferous are conspicuous by their excessive thinness or even by their absence. No. 3 is usually limited to America in its application, and would, I think, have no chance of being naturalized with us; besides, even American geologists while using it frequently condemn the term. No. 5 is limited in its value, as it can only be properly used in connexion with the presence of *Fusulina*, and even then is decidedly a bad term, since that Foraminifer is now known to range into the Permian, if not higher still. No. 6, including as it does large series of beds of doubtful age, some of which are not Carboniferous, would, I think, find no supporters, and although still much used on the Continent, is unknown in England. No. 8 is again a French name, formerly much in vogue, but as it is the most strictly lithological of the lot, it must, I venture to say, be also the worst of all. Against Nos. 2, 4, and 7 there is not much to say, their use is well understood, but the facts yet remain, that the series is sometimes devoid of limestone, frequently yields no *Producti*, and often contains no Coal.

It is curious that as against the eight chief lithological synonyms of Bernician, I can find but one geographical one which has ever been in common use. This name, "Condrusian," was proposed by André Dumont in or about 1843, and if equally good would therefore have priority over Dr. Woodward's term. Condrusian, however, was made to include a great deal more than the marine Lower Carboniferous. It comprised Devonian rocks also, and the Condroz, whence the name is taken, is now associated in the minds of geologists more with the latter than with the former. Under these circumstances, and considering also that the term was probably meant as a strictly local one by its author, it will be well to place it with the eight preceding names as being each and all liable to misinterpretation, although no doubt blind custom will perpetuate the use of some of them—probably the worst.

Having endeavoured to show the disadvantages under which labour the rivals of "Bernician," it is time to consider the advantages of that name. In the first place it is geographical, it is derived from that part of Britain in which the beds which it denotes are most largely developed, where especially the characters marking the series elsewhere are found associated, as, I believe, they are nowhere else. There numerous beds of limestone represent the massive calcareous mass of Derbyshire; there occur the Coal-bearing beds of Russia and the *Posidonomya Becheri* shales of the Culm; there the sandstone and grit facies of the Series is most strongly developed; and there finally are the palæontological characters of the Silesian, Belgian, and Scotch series blended in an almost unique manner. These are all qualities which eminently fit Bernicia to be looked upon as a type locality or region. In the second place, the name "Bernician" gives rise to no preconceived notion that experience can prove untrue, it expresses a geographical truth and nothing more.

Dr. Woodward and Dr. Karl Mayer evidently intended to include everything between the Millstone Grit and Devonian under the term "Bernician," whereas in the paper to which I have already referred, and which was purely local in character, I retained the name "Tuedian" for the Calciferous sandstone series. I, however, also showed that the line of division between Tuedian and Bernician was a variable one, that the one series ran into the other as it were, and that moreover the base of the Tuedians (in which I include the so-called Upper Old Red Conglomerate) in a similar manner ran into the Old Red, and was not sharply divided from it. The former of these points I again urged more strongly at the Glasgow Meeting of the British Association in September last. The question left to be decided is this:—Is "Bernician" to be distinct from Tuedian, or is it to contain it as a subordinate member? This is not an easy question to answer at present, but I incline to think that the last will be nearer the truth, and that in time the Tuedians will come to be looked upon as passage-beds from Old Red to Bernician, parts of which may be claimed by both.

The word Tuedian which I employ is in much disfavour in Scotland. The only objections to its use that I have heard, however, are,—first, that the "Cement-stone and red-sandstone series" occurs throughout all the Carboniferous districts of Scotland, and is in the Lothians much more typically developed than in the Tweed Basin; and. secondly, that the name "Calciferous sandstone series" given to these rocks by Maclaren in 1839 is a good one.

To the second objection it may be at once replied that as a purely lithological term of necessarily only local application, exception might well be taken to Maclaren's name even were it not so dangerously similar to the Potsdam "Calciferous series" of North America, or even to our Oxfordian "Calcareous grit." The first objection is a stronger one, but it does not show that "Tuedian" is a bad name—only that a better might be invented. If a better one had thus been proposed before 1855, so much the better; but "Tuedian" came out then, and if not the best possible is yet a geographical name, and not a bad one in itself; is it not better to retain it, whatever the classificatory value of the beds which it represents may prove to be?

In conclusion, may I venture to hope that before long some rules respecting stratigraphical nomenclature may be promulgated which may regulate in some way the issue of new names. It will surprise some of your readers when I say that I have lying before me a list of more than four thousand stratigraphical names.

NOTICES OF MEMOIRS.

I.—THE TROPICAL FORESTS OF HAMPSHIRE: BEING THE SUBSTANCE OF A LECTURE DELIVERED IN CONNEXION WITH THE LOAN COLLECTION, SOUTH KENSINGTON, by J. S. GARDNER, F.G.S., Saturday. Dec. 2nd, 1876.

"ENGLAND at the present time has a climate far from tropical, but the time to which I refer was when the palm and spice-plants flourished here, and when the climate may rightly be spoken of as tropical, not in a poetical or metaphorical sense, but actually. The data on which our inferences are based are the fossil leaves which we find in the clays of the south of Hampshire. Out of the many thousands obtained during many years, I have selected some which have been exhibited in the Loan Collection. Some have also been brought in illustration of our subject to-night. Collections of leaves from this spot and from Alum Bay have also been made by Mr. W. S. Mitchell, M.A., and others, and are now preserved in the British Museum.

It is the district immediately along the line east and west of Bournemouth which I have specially examined. The beds which occupy this area are of the age of the Lower Bagshot. Above the Bagshot series we have the Bracklesham beds full of marine forms; the Barton beds, also full of marine forms, but telling a tale of a different sea; the Headon, Bembridge, and Hempstead series, with many repetitions of marine and fresh-water conditions, indicative of long lapses of time. There is, too, the whole Miocene period, of which we have no trace in this district, but which we believe from continental evidences was of vast duration. Then, too, there followed periods of immense length, during which England underwent its latest Glacial epoch; after that the time during which the River Valley gravels and Brick-earths were formed. While, therefore, we speak of these beds as almost the youngest of the geological series, they really belong, when measured in years, to periods of an incalculably remote past."

With the help of diagrams and pictures Mr. Gardner traced the series of beds from Corfe to Wareham, Poole, and Studland, and then back from Studland to the mouth of Poole Harbour, and along the shore past Branksome to Bournemouth, and on to Hengistbury Head, the physical features and general appearance of the country being described. The alternations of clays, sands, and pebble beds, as they appear in the cliffs, and the pipe-clay diggings, were especially referred to, and Mr. Gardner then continued:—"No order of arrangement is at first apparent in these beds, but by traversing the sections many times and studying